Walter's Model

Tuesday 27
Day (178-187)

$$P = \frac{D + \frac{r}{k_e}(E - D)}{k_e}$$

Where, P = Price of equity shares,

D = Initial Dividend Per share (DPS).

E = Initial Earning Per Share (EPS).

r = Expected rate of return on firm investment or the internal rate of return.

$k_e$ = Cost of equity Capital or the rate of return expected by the shareholders or the capitalisation rate.

## Illustration 1.

Calculate the prevailing market price of a share using Walter's model from the following information:

| | |
|---|---|
| Rate of return on investment | 10% |
| Capitalisation rate | 8% |
| Earning per Share | ₹ 5 |
| Dividend per Share | ₹ 4 |

### Solution :

As per Walter's model, market price of a share ($P$) is given by,

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

where, $D$ = Dividend per share
= ₹ 4
$r$ = The rate of return on investment
= 10% = 0·10
$K_e$ = Cost of equity capital or capitalisation rate
= 8% = 0·08
and $E$ = Earnings per Share
= ₹ 5

Now, putting the respective values in the model, we get,

$$P = \frac{₹4 + \frac{0·10}{0·08}(₹5 - ₹4)}{0·08} = ₹\ 65·63$$

So, the prevailing market price of a share using Walter's model is ₹ 65·63.

## Illustration 2.

X Ltd. earns ₹ 6 per share having a capitalisation rate of 10 per cent and has a return on investment of 20%. According to Walter's model, what should be the price of the share at 25% dividend pay-out?

*[CA Inter Nov, 2012]*

### Solution :

According to Walter's model, market price of a share, P is given by,

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

where,

$D$ = Dividend per share i.e., *EPS* x *D/P* Ratio
or, ₹ 6 × 25% = ₹ 1·50.
$r$ = Rate of return on investment i.e., 20% or 0·20.
$K_e$ = Capitalisation rate i.e., 10% or 0·10.

$E$ = Earnings per share i.e., ₹ 6.

Now, putting the values in the model, we get,

$$P = \frac{₹1{\cdot}50+\frac{0{\cdot}20}{0{\cdot}10}(₹6-₹1{\cdot}50)}{0{\cdot}10}$$

$$= ₹\ 105$$

**Illustration 3.**

From the following information supplied to you, determine the theoretical market value of equity shares of a company as per Walter's Model :

| | |
|---|---|
| Earnings of the company | ₹ 5,00,000 |
| Dividend paid | ₹ 3,00,000 |
| Number of shares outstanding | 1,00,000 |
| Price-earning ratio | 8 |
| Rate of return on investment | 15% |

Are you satisfied with the current dividend policy of the firm ? If not, what should be the optimal dividend pay-out ratio in this case ?

*[C.U. B.Com (H), 2019][Almost similar to C.A. Inter, Nov 2014]*

**Solution :**

As per Walter's model, the market value of an equity share ($P$) is given by,

$$P = \frac{D+\frac{r}{K_e}(E-D)}{K_e},$$

where,

$P$ = Market value of an equity share ;

$D$ = Dividend per share

$$= \frac{\text{Dividend paid}}{\text{Number of shares outstanding}}$$

$$= \frac{₹3,00,000}{1,00,000} = ₹\ 3\ ;$$

$r$ = Rate of return on investment

$= 0{\cdot}15$ ;

$K_e$ = Capitalisation rate

$$= \frac{1}{\text{Price-earning Ratio (P/E Ratio)}}$$

$$= \frac{1}{8}$$

$$= 0{\cdot}125$$

and $E$ = Earnings per Share

$$= \frac{\text{Total Earnings}}{\text{Number of shares outstanding}}$$

$$= \frac{₹5,00,000}{1,00,000}$$

$$= ₹ 5.$$

Now, putting the values,

$$P = \frac{₹3 + \frac{0.15}{0.125}(₹5 - ₹3)}{0.125} = ₹ 43.20$$

So, the theoretical market value of an equity share is ₹ 43·20.

But we are not satisfied with the current dividend policy. As the firm is a growth firm, where $r$ (0·15) > $K_e$ (0·125), the optimum dividend pay-out ratio should be zero.

This can be shown by considering following four situations.

**$D$ = zero**

$$P = \frac{0 + \frac{0.15}{0.125}(₹5 - 0)}{0.125}$$

$$= ₹ 48$$

**$D$ = ₹ 1**

$$P = \frac{₹1 + \frac{0.15}{0.125}(₹5 - ₹1)}{0.125}$$

$$= ₹ 46.40$$

**$D$ = ₹ 2**

$$P = \frac{₹2 + \frac{0.15}{0.125}(₹5 - ₹2)}{0.125}$$

$$= ₹ 44.80$$

**$D$ = ₹ 4**

$$P = \frac{₹4 + \frac{0.15}{0.125}(₹5 - ₹4)}{0.125}$$

$$= ₹ 41.60$$

Thus, it is clear from above that the market price of an equity share is maximum (i.e., ₹ 48) when the dividend pay-out ratio becomes zero.

### Illustration 4.

Following information relating to Jee Ltd. are given :

| | |
|---|---|
| Profit after tax | ₹ 10,00,000 |
| Dividend pay-out ratio | ₹ 50% |
| Number of Equity Shares | 50,000 |
| Cost of Equity | 10% |
| Rate of Return on Imvestment | 12% |

(i) What would be the market value per share as per Walter's model?

(ii) What is the optimum dividend pay-out ratio according to Walter's Model and Market value of equity share at that pay-out ratio? *[C.A. Inter Nov., 2018]*

*[Almost similar to C.A. Nov, 2010]*

**Solution :**

Market value per share ($P$) as per Walter's Model is given by,

$$P = \frac{D+\frac{r}{k_e}(E-D)}{k_e}$$

where,

$D$ = Dividend per share (i.e., 50% of ₹ 10,00,000)/50,000 shares)
or, ₹ 10 per share

$r$ = Rate of return on investment i.e. 12% or 0·12

$K_e$ = Cost of equity i.e., 10% or 0·10

$E$ = Earnings per share (i.e., ₹ 10,00,000/50,000 shares)
or, ₹ 20

Now, putting the values,

$$P = \frac{₹10+\frac{0·12}{0·10}(₹20-₹10)}{0·10}$$

$$= ₹\ 220$$

**(ii) Optimum Dividend Pay-out (D/P) Ratio.**

According to Walter's model when the return on investment ($r$) is more than the cost of capital ($K_e$) i.e., $r$ (0·12) > $K_e$ (0·10), the firm is considered as a growth firm. In that case, the price per share increases as the D/P ratio decreases. Hence, the optimum dividend pay-out ratio in this case should be Zero or Nil.

Therefore, at D/P ratio of zero, the market price per share ($P$) will be,

$$P = \frac{0+\frac{0·12}{0·10}(20-0)}{0·10}$$

$$= ₹\ 240$$

## Illustration 5.

You are requested to find out the approximate dividend payment ratio as to have the share price at ₹ 56 by using Walter's Model, based on following information available for a company.

| | |
|---|---|
| Net Profit | ₹ 50 lakhs |
| Outstanding 10% Preference Shares | 80 lakhs |
| Number of Equity Shares | 5 lakhs |
| Return on Investment | 15% |
| Cost of Capital (after tax) ($K_e$) | 12% |

*[C.A. Inter, May, 2017]*

**Solution :**

**Calculation of Dividend Pay-out (D/P) Ratio**

$$\text{D/P Ratio} = \frac{\text{Dividend Per Share } (DPS)}{\text{Earnings Per Share } (EPS)}$$

*Where,*

$$EPS = \frac{\text{Earnings available to equity shareholders i.e., PAT – preference dividend}}{\text{Number of equity shares}}$$

$$= \frac{₹50,00,000 \text{ (assuming after tax)} - (10\% \text{ of } ₹80,00,000) \text{ or } ₹8,00,000}{5,00,000}$$

$$= \frac{₹42,00,000}{5,00,000} = ₹\ 8{\cdot}40$$

DPS may be computed as follows :

$$P = \frac{D+\frac{r}{K_e}(E-D)}{K_e} \quad \text{[Using Walter's Model]}$$

*Where,*

$P$ = Market price i.e., ₹ 56.

$D$ = *DPS*

$r$ = Return on investment i.e., 15% or 0·15

$K_e$ = Cost of equity capital i.e., 12% or 0·12

$E$ = EPS *i.e.*, ₹ 8·40

Now, putting the values,

$$₹\ 56 = \frac{D+\frac{0{\cdot}15}{0{\cdot}12}(₹\ 8{\cdot}40-D)}{0{\cdot}12}$$

*or,* $56 \times 0{\cdot}12 = D + 10{\cdot}50 - 1{\cdot}25D$

*or,* $6{\cdot}72 = 10{\cdot}50 - 0{\cdot}25\ D$

*or,* $0{\cdot}25D = 10{\cdot}50 - 6{\cdot}72$

$\therefore \quad D = \frac{3{\cdot}78}{0{\cdot}25} = ₹\ 15{\cdot}12$

Now, D/P Ratio $= \frac{₹\ 15{\cdot}12}{₹\ 8{\cdot}40} \times 100$

$= 180\%$

## Illustration 6.

The following information is available in respect of a firm :

Capitalisation rate ($K_e$) = 0·10

Earnings per share ($E$) = ₹10

Assumed rate of return on investments ($r$) : (*i*) 15%, (*ii*) 10% and (*iii*) 8%.

Show the effect of dividend policy on the market price of shares, using Walter's model. Assum
Dividend Pay-out ratio (D/P Ratio) : 0%, 25%, 50%, 75% and 100%.

Also state the optimum dividend pay-out ratio.

## Solution :

According to Walter's Model, market price of a share, $P$ is given by,

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

*Where,*

$D$ = Dividend per share,

$r$ = Rate of return on investment,

$K_e$ = Capitalisation rate,

$E$ = Earnings per share.

**Situation 1 :**

**When $r = 15\%$ or $0{\cdot}15$ and $K_e = 0{\cdot}10$**

*(i.e., $r > K_e \Rightarrow$ Growth Firm)*

Value of Shares (Walter's Model) at different D/P Ratio :

**D/P ratio = 0%**

(i.e., Dividend per Share = zero)

$$P = \frac{0 + \frac{0{\cdot}15}{0{\cdot}10}(₹10 - 0)}{0{\cdot}10}$$

$$= ₹\ 150$$

**D/P ratio = 25%**

(i.e., Dividend per Share = ₹ 2·50)

$$P = \frac{₹2{\cdot}50 + \frac{0{\cdot}15}{0{\cdot}10}(₹10 - ₹2{\cdot}50)}{0{\cdot}10}$$

$$= ₹\ 137{\cdot}50$$

**D/P ratio = 50%**

(i.e., Dividend per Share = ₹ 5)

$$P = \frac{₹5 + \frac{0{\cdot}15}{0{\cdot}10}(₹10 - ₹5)}{0{\cdot}10}$$

$$= ₹\ 125$$

**D/P ratio = 75%**

(i.e., Dividend per Share = ₹ 7·50)

$$P = \frac{₹7{\cdot}50 + \frac{0{\cdot}15}{0{\cdot}10}(₹10 - ₹7{\cdot}50)}{0{\cdot}10}$$

$$= ₹\ 112{\cdot}50$$

**D/P ratio = 100%**

(i.e., Dividend per Share = ₹10)

$$P = \frac{₹10 + \frac{0{\cdot}15}{0{\cdot}10}(₹10 - ₹10)}{0{\cdot}10}$$

$$= ₹\ 100$$

**Interpretation :**

From the above calculation, it is quite clear that the value of shares ($P$) is inversely related to the D/P ratio. As the pay-out ratio increases, the market value of shares declines. This is so, because the firm is a growth firm (where $r > K_e$) and is able to earn a return on investments ($r$) exceeding the required rate of return ($K_e$). The market value of shares (₹ 150) is highest when D/P ratio is zero, i.e. the firm retains its entire earnings. When all earnings are distributed, i.e. D/P ratio is 100%, then its market value shows the lowest price (₹ 100).

**So, the optimum pay-out ratio is zero.**

**Situation 2 :**

**When** $r = 10\%$ or $0{\cdot}10$ and $K_e = 0{\cdot}10$

(i.e., $r = K_e \Rightarrow$ Normal firm).

Value of shares (Walter's Model) at different D/P Ratio :

**D/P ratio = 0%**

(Dividend per Share = zero)

$$P = \frac{0 + \frac{0{\cdot}10}{0{\cdot}10}(₹10 - 0)}{0{\cdot}10}$$

$= ₹\ 100$

**D/P ratio = 25%**

(Dividend per Share = ₹ 2·50)

$$P = \frac{₹2{\cdot}50 + \frac{0{\cdot}10}{0{\cdot}10}(₹10 - ₹2{\cdot}5)}{0{\cdot}10}$$

$= ₹\ 100$

**D/P ratio = 50%**

(i.e., Dividend per Share = ₹ 5)

$$P = \frac{₹5 + \frac{0{\cdot}10}{0{\cdot}10}(₹10 - ₹5)}{0{\cdot}10}$$

$= ₹\ 100$

**D/P ratio = 75%**

(Dividend per Share = ₹ 7·50)

$$P = \frac{₹7{\cdot}50 + \frac{0{\cdot}10}{0{\cdot}10}(₹10 - ₹7{\cdot}50)}{0{\cdot}10}$$

$= ₹\ 100$

**D/P ratio = 100%**

(Dividend per Share = ₹ 10)

$$P = \frac{₹10 + \frac{0{\cdot}10}{0{\cdot}10}(₹10 - ₹10)}{0{\cdot}10}$$

$= ₹\ 100$

**Interpretation :**

Under this situation, when $r = K_e$, the market value of shares is constant irrespective of the D/P Ratio. It is a matter of indifference whether the firm retains whole of the profits or distribute dividends. So, there is no optimum dividend policy. But this is a hypothetical situation ; $r$ and $K_e$ cannot be the same. Moreover, Walter concludes that dividend policy does matter as a variable in maximising share prices.

**Situation 3 :**

**When** $r = 8\%$ or $0{\cdot}08$ and $K_e = 0{\cdot}10$

(*i.e.*, $r < K_e \Rightarrow$ Declining Firm)

Value of shares (Walter's Model) at different D/P Ratio :

**D/P ratio = 0%**

(Dividend per Share = zero)

$$P = \frac{0 + \frac{0{\cdot}08}{0{\cdot}10}(₹10 - 0)}{0{\cdot}10}$$

$= ₹\ 80$

**D/P ratio = 25%**

(Dividend per Share = ₹ 2·50)

$$P = \frac{₹2{\cdot}50 + \frac{0{\cdot}08}{0{\cdot}10}(₹10 - ₹2{\cdot}50)}{0{\cdot}10}$$

$= ₹\ 85$

**D/P ratio = 50%**

(i.e., Dividend per Share = ₹ 5)

$$P = \frac{₹5 + \frac{0.08}{0.10}(₹10 - ₹5)}{0.10}$$

$$= ₹\ 90$$

**D/P ratio = 75%**

(Dividend per Share = ₹ 7·50)

$$P = \frac{₹7.50 + \frac{0.08}{0.10}(₹10 - ₹7.50)}{0.10}$$

$$= ₹\ 95$$

**D/P ratio = 100%**

(Dividend per Share = ₹ 10)

$$P = \frac{₹10 + \frac{0.08}{0.10}(₹10 - ₹10)}{0.10}$$

$$= ₹\ 100$$

**Interpretation :**

When the firm is a declining firm, where $r < K_e$, D/P ratio and the value of share are correlated positively. That is, when pay-out ratio increases, the market value of shares also increases and vice versa. The market value of share is maximum (₹ 100) when D/P ratio is 100%. So, under this situation, it is advisable to distribute the entire earnings as dividend to the shareholders.

**Therefore, the optimum D/P Ratio is 100%.**